

**What is claimed is:**

1. A mobile device communications system which has a plurality of service providing servers, and  
5 is used for communications by a mobile terminal, comprising:

a first network unit which is connected to the mobile terminal and has a plurality of input/output points to and from the service providing servers;

10 a plurality of first communications distribution units respectively connected to the plurality of input/output points;

a second network unit connected to said first communications distribution unit;

15 a third network unit connected to the plurality of service providing servers; and

a plurality of second communications distribution units which are connected between said second network unit and said third network unit, for  
20 distributing a series of communications between the mobile terminal and the service providing server to any of the plurality of service providing server, characterized in that

said first communications distribution unit  
25 distributes a series of communications between said

mobile terminal and service providing servers to any of said plurality of second communications distribution units through said second network unit.

5        2.        The system according to claim 1, characterized in that

              each of said plurality of first communications distribution units comprises a same storage contents of distribution destination storage unit  
10        storing any of said plurality of second communications distribution units to which a series of communications are to be distributed corresponding to an identifier of a session as the series of communications between the mobile  
15        terminal and the service providing servers.

3.        The system according to claim 1, characterized in that:

              the plurality of service providing servers  
20        form a plurality of groups each being configured by servers providing same services;

              the mobile terminal specifies a representative address for each of the plurality of groups to communicate with service providing servers; and

25        said second communications distribution unit

when the mobile terminal changes the representative address for a change of a service to be obtained in the series of communications by the mobile terminal, said second communications distribution unit distributes subsequent communications in the series of communications to any of the service providing servers in the group specified by the representative address after the change to continue the series of communications.

a service authentication unit checking whether or not a user of the mobile terminal has a right to receive a service provided by the service providing servers when said second communications distribution unit distributes the series of communications to any of the plurality of service providing servers.

6. The system according to claim 1, characterized in that:

5       said second communications distribution unit can distribute the series of communications not only to the plurality of service providing servers, but also to a server external to said mobile device communications system; and

10       said system further comprises an accounting information generation unit generating accounting information about a service received by the mobile terminal from the service providing servers or a server external to said mobile device communications system..

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7. The system according to claim 1, further comprising

20       a session management device assigning an identifier to a session as a series of communications between the mobile terminal and the service providing servers to manage the identifier.

8. The system according to claim 7, characterized in that

25       said second communications distribution unit

assigns an identifier to a user session as a series of communications in a layer higher than a layer corresponding to a session managed by said session management device in a hierarchical structure of communications, and distributes communications in the user session between the mobile terminal and the service providing servers to any of the plurality of service providing servers.

9. The system according to claim 8, characterized in that

there are a plurality of types as types of the user session, and said second communications distribution unit distributes communications in the user session corresponding to the type of the user session.

10. A mobile device communications method for use with a plurality of service providing servers for communications by a mobile terminal, comprising the steps of:

the mobile terminal transmitting a packet in a series of communications by specifying any of the plurality of service providing servers;

a load balancer, which received the packet,

distributing the packet to any of the plurality of packet gateway devices corresponding to an identifier for the series of communications; and

5        said packet gateway device which was assigned the packet distributing the packet to any of the plurality of service providing servers for performing the same services as the service providing server specified by the mobile terminal.

10       11. The method according to claim 10, characterized in that:

         the series of communications are a session managed by a session management device; and

15        said packet gateway device distributes a packet corresponding to a user session as a series of communications in a layer higher than a layer corresponding to the session in a hierarchical structure of communications.

20       12. A computer-readable portable storage medium which is used by a computer configuring a packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers  
25       connected to a network to which a mobile terminal

is connected in a mobile device communications system having the plurality of service providing servers for establishment of communications performed by the mobile terminal, and stores a  
5 program used to direct the computer to perform the steps of:

storing a destination address and a source address of a packet received from the load balancer using a unique source port number as a key;

10 setting the unique source port number as a source port number of a packet header;

selecting any of a plurality of service providing servers capable of providing a service requested by the mobile terminal from among the  
15 plurality of service providing servers such that the loads of the service providing servers can be balanced; and

transmitting a packet to the service providing server with an address of the selected service  
20 providing server set as a destination address, and an address of the device set as a source address.

13. The storage medium according to claim 12, characterized in that

25 an identifier for a user session as a series

of communications in a layer higher than a layer corresponding to a session as a series of communications between the mobile terminal and the service providing server in a hierarchical structure of communications is used as the unique source port number.

14. A program used by a computer configuring a packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device communications system having the plurality of service providing servers for establishment of communications performed by the mobile terminal, and is used to direct the computer to perform the procedures of:

storing a destination address and a source address of a packet received from the load balancer using a unique source port number as a key;

setting the unique source port number as a source port number of a packet header;

selecting any of a plurality of service providing servers capable of providing a service



requested by the mobile terminal from among the plurality of service providing servers such that the loads of the service providing servers can be balanced; and

5           transmitting a packet to the service providing server with an address of the selected service providing server set as a destination address, and an address of the device set as a source address.

10       15. The program according to claim 13, characterized in that

          an identifier for a user session as a series of communications in a layer higher than a layer corresponding to a session as a series of  
15       communications between the mobile terminal and the service providing server in a hierarchical structure of communications is used as the unique source port number.

20       16. A computer-readable portable storage medium which is used by a computer configuring a packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers  
25       connected to a network to which a mobile terminal

is connected in a mobile device communications system having the plurality of service providing servers for establishment of communications performed by the mobile terminal, and stores a  
5 program used to direct the computer to perform the steps of:

retrieving mobile device identification information about a mobile terminal as a source of a packet received from the load balancer;

10 retrieving a destination address of the received packet;

determining whether or not a service provided by the service providing server of the destination address can be provided for a user of the mobile  
15 terminal.

17. A computer-readable portable storage medium which is used by a computer configuring a packet gateway device for distributing communications to a  
20 service providing server between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device communications system having the plurality of service providing  
25 servers for establishment of communications

performed by the mobile terminal, and stores a program used to direct the computer to perform the steps of:

- 5       retrieving from a packet received from the load balancer a destination address and a source address of the packet when a series of communications between the mobile terminal and the service providing server start, and setting the addresses in an accounting record;
- 10       incrementing a number of packets of an accounting record each time a packet is received from the load balancer until the series of communications terminate, retrieving a packet length from the received packet, and adding the
- 15       packet length to the packet length of the accounting record; and
- 20       setting again the source address of the accounting record into identification information about a user of the mobile terminal, and the destination address into information about the service providing server.

18.   A program used by a computer configuring a packet gateway device for distributing
- 25       communications to a service providing server

between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device communications system having the plurality of  
5 service providing servers for establishment of communications performed by the mobile terminal, and is used to direct the computer to perform the procedures of:

retrieving mobile device identification  
10 information about a mobile terminal as a source of a packet received from the load balancer;

retrieving a destination address of the received packet;

determining whether or not a service provided  
15 by the service providing server of the destination address can be provided for a user of the mobile terminal.

19. A program used by a computer configuring a  
20 packet gateway device for distributing communications to a service providing server between a plurality of load balancers and service providing servers connected to a network to which a mobile terminal is connected in a mobile device  
25 communications system having the plurality of

service providing servers for establishment of communications performed by the mobile terminal, and is used to direct the computer to perform the procedures of:

5           retrieving from a packet received from the load balancer a destination address and a source address of the packet when a series of communications between the mobile terminal and the service providing server start, and setting the  
10           addresses in an accounting record;

          incrementing a number of packets of an accounting record each time a packet is received from the load balancer until the series of communications terminate, retrieving a packet  
15           length from the received packet, and adding the packet length to the packet length of the accounting record; and

          setting again the source address of the accounting record into identification information  
20           about a user of the mobile terminal, and the destination address into information about the service providing server.

20.   A mobile device communications system which  
25           has a plurality of service providing servers, and

is used for communications by a mobile terminal,  
comprising:

5 a network unit which is connected to the  
mobile terminal and has a plurality of input/output  
points to and from the service providing servers;

a plurality of first communications  
distribution units respectively connected to the  
plurality of input/output points; and

10 a plurality of second communications  
distribution units, connected between said  
plurality of first communications distribution  
units and the plurality of service providing  
servers, for distributing a series of  
communications between the mobile terminal and the  
15 service providing server to any of the plurality of  
service providing servers, characterized in that

although the communications between the mobile  
terminal and the service providing server are  
performed through any of the plurality of  
20 input/output points of the network unit from start  
to termination of the series of communications, any  
of said plurality of first communications  
distribution units distributes the series of  
communications to a same second communications  
25 distribution unit from among said plurality of

second communications distribution units.